SESSION 2 – NAVIGATION AND INFORMATION SYSTEMS 1

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TITLE OF PRESENTATIONS AND SPEAKERS
"Development and Implementation of Coastal AIS Network Concepts, with MTS Implications" by Magnus Nyberg, Saab Transponder Tech

"Intelligent Waterway Systems (IWS)" by Jay Spalding, U.S. Coast Guard

"The United States ENC Program of the Coast Survey" by Mike Brown, National Ocean Service, NOAA

"Prospect for PORTS" by Kathryn Bosley and Mark Bushnel, National Ocean Service, NOAA

"Linking Risk Assessment of Marine Operations to Safety Management in Ports" by Vladimir Trbojevic, EQE International Ltd.

SUMMARY
This first session of Navigation Information Systems introduced a combination of proven and burgeoning technologies that offer disparate collection opportunities, but insufficient in number and scope to provide integrated solutions. Each, however shows advancement and greater potential to gather data for user exploitation and exchange, thereby contributing to the safety and productivity benefits of systematic marine transportation as a mode. Risk management was introduced as a means of significant improvement to MTS performance, with a need for input data from a greater variety and scope of sources than the Information Systems as presented, further pointing the need for comprehensive strategic planning that would enhance component development, and therefore synergy.

Development and Implementation of Coastal AIS Network Concepts, with MTS Implications
Marcus Nyberg's presentation addressed shore based AIS network implementations and, as an example, showed the implementations in the Baltic Sea area. It has long been realized that an automatic reporting device (transponder) fitted on a ship/airplane (mobile station), could be beneficial to the safety of navigation and the control and monitoring of the maritime environment. An automatic reporting system called the Automatic Identification System (AIS) has been adopted by IMO as carriage requirement for ship sailing under the SOLAS regulations. Domestic requirements for other vessels such as tugs, fishing vessels, pilot boats, etc. will be seen on several places worldwide. In order to use the AIS functionality in a broader range for shore applications, a shore-based infrastructure has to be established. A shore-based network solution has a great deal to offer various groups of users such as maritime authorities, port authorities, and shipping offices. The AIS eases the communications workload on all parties due to automatic and continuous transmission of ships position, static, and voyage-related data and by providing means to send/receive text and binary messages. Operators and watch keeping officers can focus on operational and

logistical issues. The digital data link for ship-to-shore and shore-to-ship enables real-time monitoring and messaging between mobile stations and shore applications. The shore-based network infrastructure enables distribution of information in a very cost effective manner to mobile stations moving in coastal areas, by using the functionality of the AIS-transponder system. This information can consist of re-broadcast of position reports, navigational data, weather reports, real-time hydrographical data, DGNSS corrections, and port information. The authorities could also, by means of the shore infrastructure, provide fleet and port management services to shipping and transportation agencies by using the precise information existing in the system. In order to better perform these activities efficiently over a broader area, a shore-based infrastructure must exist which can take care of the communications needs between shore and ship-based users. Since 1998, Saab TransponderTech (STT) has developed solutions for a shore-based network that meets the various demands for a network infrastructure consisting of multiple shore users.

Intelligent Waterway System
Various MTS users and stakeholders recognize the need for improvement in information transfer. Because of the diversity of MTS interests, the quick fixes that result are often extremely limited in the type of information transferred, and generally have a specific information provider-information user channel. This "stovepipe" effect is often unnecessarily duplicated. The concept of an Intelligent Waterway System (IWS) is one where information transfer becomes more efficient, accurate, and

timely. Recent studies have concluded that development of an IWS for the United States is necessary to keep pace with the continuing growth in the amount of waterborne commerce seen over the past decade and forecast for the future. The U.S. Coast Guard has begun a research effort to improve the efficiency and effectiveness of maritime related functions through the application of information technology. This is being done through the efforts of several projects including automatic identification systems and augmented reality for navigation, as well as interagency efforts.

We propose a network approach, taking advantage of existing Internet technology. To achieve the desired result, we expect to use a Peer-to-peer methodology of distributed content rather than an "information hub." Existing technology allows for content security and limited distribution where necessary to protect sensitive information. A new, content-based mark-up language will be the basis for information transfer and transfer protocol.

The U.S. ENC Program of the Coast Survey
The Office of Coast Survey (OCS), National Ocean Service (NOS) of the United States National Oceanic and Atmospheric Administration (NOAA) is creating a database of digital vector chart data for the production of Electronic Navigational Charts (ENC). Mike Brown's presentation described the ENC program in detail and reviewed the project's status to date. In doing so, he noted that the ENCs will be in the International Hydrographic Organization (IHO) format as defined in Edition 3.0 of

Publication S-57: IHO Transfer Standard for Digital Hydrographic Data. To provide ENC data to mariners and other users in a timely manner, NOS will produce ENCs for the 40 major commercial ports and for private sector companies to use in custom products and services. ENC data will be compiled from original source materials where appropriate to provide the most accurate data available. The ENC database will be kept in continual maintenance (i.e., up to date on a weekly basis), allowing ENC users to obtain vector data sets that contain the most current and accurate information.

Prospect for PORTS

Kathryn Bosley gave a presentation on the Physical Oceanographic Real-Time System (PORTS^{TM}), a program of NOS's Center for Operational Oceanographic Products and Services (CO-OPS) that supports safe and efficient navigation by providing ship masters and pilots with accurate, real-time information required to avoid groundings and collisions while, at the same time, maximizing waterway throughput. Beginning in 1991 with the installation of a prototype in Tampa Bay, PORTS^{TM} has developed into a national network. PORTS^{TM} comes in a variety of sizes and configurations, each specifically designed to meet user requirements and to take into account geographic and hydrologic differences between waterways. Today in addition to Tampa Bay, New York/New Jersey Harbor, San Francisco Bay, Houston/Galveston Bay, Narragansett Bay, Los Angeles-Long Beach Harbor, Soo Locks, and Chesapeake Bay are home to full scale operational PORTS^{TM}. PORTS^{TM} is a partnership based on extensive collaboration between NOS

and local maritime communities to identify and satisfy user needs. Pursuant to congressional direction, CO-OPS oversees the implementation, operation, and maintenance of these systems that are funded by local user organizations.

Linking Risk Assessment of Marine Operations to Safety Management in Ports

Vladimir Trbojevic proposed an approach for developing Integrated Safety Management Systems (ISMS) for managing navigation and other marine operations in ports. The methodology requires that all risks are identified and evaluated, that suitable controls are in place to manage these risks, and that the linkage between risk controls, operating procedures, harbor by-laws, and the management activities is explicitly established. This methodology has been applied to a number of ports in the United Kingdom in compliance with the Port Marine Safety Code requirement. Mr. Trbojevic also discussed an extension of the methodology towards assessing focus and robustness of the ISMS, as well as some ideas about ISMS safety ratings.